Nevada Division of Environmental Protection
Bureau of Air Quality Planning

FACT SHEET

January 2005

AIRBORNE DUST AND SMOKE: HEALTH AND ENVIRONMENTAL EFFECTS OF PARTICULATE MATTER

Why Are We Concerned about Particulate Matter?

- Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles (larger than 2.5 micrometers) come from a variety of sources, including windblown dust and grinding operations. Fine particles (less than 2.5 micrometers) often come from fuel combustion, including smoke from forest fires and prescribed burns; power plants; and diesel buses and trucks.

- High levels of particulate matter can result from natural events such as volcanic and seismic activity, high winds, and wildland fires; or from temporary or exceptional events such as structural fires, chemical spills, industrial accidents, and clean-up activities following a major disaster.

- These fine particles are so small that several thousand of them could fit on the period at the end of this sentence.

    - They are of health concern because they easily reach the deepest recesses of the lungs.

- Batteries of scientific studies have linked particulate matter, especially fine particles (alone or in combination with other air pollutants), with a series of significant health problems, including:

    - Premature death;
    - Respiratory related hospital admissions and emergency room visits;
    - Aggravated asthma;
    - Acute respiratory symptoms, including aggravated coughing and difficult or painful breathing;
    - Chronic bronchitis;
    - Decreased lung function that can be experienced as shortness of breath; and
    - Work and school absences.

Who Is Most at Risk from Exposure to Fine Particles?

- The Elderly:

- Studies estimate that tens of thousands of elderly people die prematurely each year from exposure to ambient levels of fine particles.
- Studies also indicate that exposure to fine particles is associated with thousands of hospital admissions each year. Many of these hospital admissions are elderly people suffering from lung or heart disease.

- Individuals with Preexisting Heart or Lung Disease:

  - Breathing fine particles can also adversely affect individuals with heart disease, emphysema, chronic bronchitis, and Chronic Obstructive Pulmonary Disease by causing additional medical treatment. Inhaling fine particulate matter has been attributed to increased hospital admissions, emergency room visits and premature death among sensitive populations.

- Children:

  - The average adult breathes 13,000 liters of air per day. Children breathe 50 percent more air per pound of body weight than adults, and children tend to be more active and spend more time outdoors than adults.
  - Because children's respiratory systems are still developing, they are more susceptible to environmental threats than healthy adults.
  - Exposure to fine particles is associated with increased frequency of childhood illnesses, which are of concern both in the short run, and for the future development of healthy lungs in the affected children.
  - Fine particles are also associated with increased respiratory symptoms and reduced lung function in children, including symptoms such as aggravated coughing and difficulty or pain in breathing. These can result in school absences and limitations in normal childhood activities.

- Asthmatics and Asthmatic Children:

  - More and more people are being diagnosed with asthma every year. Fourteen Americans die every day from asthma, a rate three times greater than just 20 years ago. Children make up 25 percent of the population, but comprise 40 percent of all asthma cases.

  - Breathing fine particles, alone or in combination with other pollutants, can aggravate asthma, causing greater use of medication and resulting in more medical treatment and hospital visits.

How Do Particulate Matter and Fine Particles Affect the Environment?

- The same fine particles linked to serious health effects are also a major cause of visibility impairment in many parts of the U.S.

- In many parts of the U.S. the visual range has been reduced 70% from natural conditions.

In the East, the current range is only 14-24 miles vs. a natural visibility of 90 miles. In the West, the current range is 33-90 miles vs. a natural visibility of 140 miles.

- Fine particles can remain suspended in the air and travel long distances. For example, air pollution from Los Angeles can end up over the Grand Canyon and in a few days can affect visibility in the Rocky Mountain National Park.

- Airborne particles can also cause soiling and damage to materials.

How To Avoid Exposure

- If you have concerns about the level of particulate matter in the air you are breathing, you should minimize your exposure by avoiding outdoor physical activity and, if you have existing respiratory problems, staying indoors with the windows closed and the air conditioning on.

- When driving in dusty or smoky air, running the car air conditioning may help to clean the cabin air by passing outside air through a filter on the way to the cabin. This technique may be ineffective in the re-circulate or maximum air conditioning mode if this mode bypasses the air conditioning filter and in cars without an air conditioning filter.

For additional copies of this fact sheet, please telephone the Bureau of Air Quality Planning at (775) 687-9354.